# Changes in neuropeptide expression after axotomy: The roles of LIF and NGF

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Many sympathetic neurons in the superior cervical ganglion (SCG) express neuropeptide Y (NPY) but few if any express galanin, vasoactive intestinal peptide (VIP) or substance P. After axotomy, however, the expression of NPY decreases while the expression of the other three peptides increases dramatically. These changes in peptide expression are part of a larger "cell body reaction" to axotomy, in which the expression of many genes change. We have identified two molecules that play a crucial role in these changes in neuropeptide phenotype: leukemia inhibitory factor (LIF) and nerve growth factor (NGF). Axotomy leads to an increased expression of the former within the SCG and a decreased level of the latter, which is normally derived from sympathetic target tissues. The presence of LIF and the absence of NGF leads to an induction of galanin, VIP, subsance P and a depression in NPY expression. These data indicate that the neuropeptide phenotype of neurons remains plastic after normal development is completed. The decreased expression of NPY after axotomy fits with the general notion that axotomized neurons decrease the expression of molecules involved in normal sympathetic transmission. While the function of the peptides induced by axotomy is not currently known, it has been speculated that they play a neurotrophic role under conditions in which the influence of target-derived neurotrophins has been removed.

Source: https://www.industrydocuments.ucsf.edu/docs/tqcb0000